

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number  
**WO 2005/004907 A1**

(51) International Patent Classification<sup>7</sup>: **A61K 39/00**,  
39/002, 39/02, 39/12, 39/295, 39/35, 39/36, A61P 37/04,  
C07K 14/025, 14/08, C12N 15/12

(21) International Application Number:  
PCT/EP2004/007679

(22) International Filing Date: 12 July 2004 (12.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/485,717 10 July 2003 (10.07.2003) US

(71) Applicant (for all designated States except US): **CYTOS BIOTECHNOLOGY AG** [CH/CH]; Wagistrasse 25, CH-8952 Schlieren (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BACHMANN, Martin, F.** [CH/CH]; Goldackerweg 8, CH-8472 Seuzach (CH). **SCHWARZ, Katrin** [DE/CH]; Schulstr. 15, 8952 Schlieren (CH).

(74) Agent: **WICHMANN, Hendrik**; Isenbruck Bösl Hörschler Wichmann Huhn, Prinzregentenstrasse 68, 81675 München (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,

TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- of inventorship (Rule 4.17(iv)) for US only

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **PACKAGED VIRUS-LIKE PARTICLES**

(57) Abstract: The present invention is related to the fields of vaccinology, immunology and medicine. The invention provides compositions and methods for enhancing immunological responses against antigens coupled or fused to virus-like particles (VLPs) packaged with immunostimulatory nucleic acids, preferably oligonucleotides containing at least one non-methylated CpG sequence and a toll-like receptor (TLR) ligand. The invention can be used to induce strong antibody and T cell responses particularly useful for the treatment of allergies, tumors and chronic viral diseases as well as other chronic diseases.



WO 2005/004907 A1